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EXAMINER	
ELALLAM, AHMED	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,692	CHERITON, DAVID R.	
	Examiner	Art Unit	
	AHMED ELALLAM	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-17,19-29,31-40,42-48,50-56,58-60,62-68,70 and 71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-17, 19-29, 31-40, 42-48, 50-56, 58-60, 62-68 and 70-71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to Amendment filed on 3/27/2008. The Amendment has been entered. Claims 1, 4-17, 19-29, 31-40, 42-48, 50-56, 58-60, 62-68 and 70-71.

Claim Objections

2. Claim 19 is objected to because of the following informalities: In claim 19, the phrase “the deferred processing queue” lacks antecedent basis. It should be changed to “the deferred forwarding queue". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 4-5, 8-10, 13, 22-25, 27-29, 32-33, 36-38, 48,49,51-52, 60 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al, 2002/0146016 A1 in view of admitted prior art, specification, paragraph [0002]. Hereinafter referred to as Liu and APA respectively.

Regarding claim 1, with reference to figures, 1, 2 and 4, Liu discloses a first gateway 114 (claimed network device) comprising:

an output port, (an output port is inherently present at the gateway because that is needed to output packet into tunnel 110c), see paragraph [0016], [0037],

a cache 118, (claimed a memory coupled to the output port);

the output port is configured to output packets for transmission via a network tunnel, see paragraph [0016], [0037];

the cache for storing packets awaiting acknowledgement from gateway 116 , the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (Claimed memory is configured to store information, and the information identifies packets which have been forwarded via the network tunnel).

Liu also discloses that the outbound packet queue 128 maintain copies of packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraph [0023]. it is inherent to have a controller in the first gateway of Liu connected to the outbound queue and to the cache because that is required to process the required information for transmitting and receiving packets and to check for acknowledgments and for managing the queues and other component of the gateway. In addition, Liu discloses an outbound packet counter 126 for counting the number of packet outstanding in the tunnel, see figure 4, unit 124. (Claimed queue indicates how many packets in each flow are outstanding within the network tunnel).

Liu does not specify the tunnel aggregating a plurality of flows.

APA discloses aggregating multiple flows into a single network tunnel. See paragraph [0002]. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the tunnel of Liu an aggregating tunnel of flows as indicated by the prior art so that traffic from different senders can be aggregated into the same tunnel increasing the throughput of Liu system in accordance with the established tunneling standards (Specification, paragraph [0003].

Regarding claim 4, Liu discloses the first gateway 114 update its session layer cache by removing acknowledged packets from the first cache 118. (Claimed memory is comprised in the control unit; and the control unit is configured to update the information in the memory to indicate that the packet was sent via the network tunnel, in response to forwarding the packet to the output port).

Regarding claim 5, Liu discloses the cache for having copies of transmitted packets awaiting acknowledgements. (A packet copied for possible retransmission is implicitly sent to awaiting queue since it awaits retransmission in accordance with other packets awaiting retransmission).

Regarding claims 8 and 9 and 10, Liu discloses a particular packet included in the outbound packet queue 128 is acknowledged, the packet can be removed from the outbound packet queue 128. (Claimed the control unit is configured to forward the copy of the packet stored in the queue to the output port for retransmission via the network tunnel if the packet is dropped in the network tunnel as in claim 8 and claimed control unit is configured to determine that the packet was dropped in the network tunnel in response to the information stored in the memory and in response to information

received from another network device, as in claim 9 and sending the copy of the packet stored in the queue via the network tunnel if the copy of the packet is dropped in the network tunnel, as in claim 10).

Regarding claim 13, Liu discloses congestion control algorithms such as congestion avoidance algorithm. (Claimed forwarding a new packet to the output port for transmission via the network tunnel if no packets have been transmitted via the network tunnel for a period of time).

Regarding claim 22, with reference to figures, 1, 2 and 4, Liu discloses system comprising:

a first gateway 114 (claimed ingress network device) coupled a second gateway 116 via tunnel 110c, (claimed an egress network device coupled to receive packets sent via the network tunnel);

the second gateway providing ACK packets to the first Gateway, see figure 2, unit 142, figure 4, and paragraph [0037], (claimed the egress network device is configured to provide information to the ingress network device, and the information indicates whether a packet transmitted from the ingress network device to the egress network device was dropped in the network tunnel).

Liu further discloses an outbound packet counter 126 for counting the number of packet outstanding in the tunnel, see figure 4, unit 124. (Claimed information indicates a capacity of deferred forwarding queue within the egress network device).

Regarding claim 23, Liu discloses a cache 118, for storing packets awaiting acknowledgement from gateway 116 , the cash including an outbound packet queue

128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (Claimed the ingress network device is configured to retransmit the packet to the egress network device if the packet is dropped in the network tunnel).

Regarding claim 24, Liu discloses a cache 118, for storing packets awaiting acknowledgement from gateway 116 , the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (claimed the ingress network device comprises a queue, the ingress network device is configured to store a copy of each packet sent via the network tunnel in the queue). Liu further disclose the first gateway 114 can then update its session layer cache by removing acknowledged packets from the first cache 118. (Claimed ingress network device is configured to remove a copy of a particular packet from the queue in response to the information indicating reception of the particular packet by the egress network device).

Regarding claim 25, Liu discloses a slow start algorithm, see paragraph. (Claimed ingress network device is configured to adjust a rate at which packets are transmitted via the network tunnel if the information indicates that the packet was dropped).

Regarding claim 27, Liu discloses using TCP acks (acknowledgements), it is inherent to Liu to store packets received out of sequence so to implement part of the TCP protocol standard that uses packet with sequence number. See paragraph [0063].

Regarding claim 28, with reference to figure 2, Liu discloses inbound packet queue that is used for forwarding the packet to a server 106, it is clear that packets in earlier sequence are first forwarded to the server and it is also clear that the queues of forwarded packets is emptied so to provide space for other incoming queues. (Claimed egress network device is configured to remove the packet from the queue in response to receiving and processing at least one packet, wherein the at least one packet is earlier in a sequence of packets than the packet; and the egress network device is configured to forward the packet in response to removing the packet from the queue).

Regarding claim 29, with reference to figures, 1, 2 and 4, Liu discloses a method comprising:

sending a packet via a network tunnel from a first gateway 114, see paragraph [0016], [0037], (claimed first network device); and a cache 118 for storing packets awaiting acknowledgement from gateway 116, the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (Claimed determining whether the packet is dropped in the network tunnel).

Liu also discloses an outbound packet counter 126 for counting the number of packet outstanding in the tunnel, see figure 4, unit 124. (claimed the queue indicates how many packets in each of the flows are outstanding within the network tunnel).

Liu does not specify the tunnel aggregating a plurality of flows.

APA discloses aggregating multiple flows into a single network tunnel. See paragraph [0002]. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the tunnel of Liu an aggregating tunnel of flows as indicated by the prior art so that traffic from different senders can be aggregated into the same tunnel increasing the throughput of Liu system in accordance with the established tunneling standards (Specification, paragraph [0003].

Regarding claims 32 and 51, Liu discloses a cache 118 for storing packets awaiting acknowledgement from gateway 116 , the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (Claimed removing the copy of the packet from the queue if the determining whether the packet is dropped in the network tunnel determines that the packet was successfully received at an egress of the network tunnel, as in claims 32 and 51, because acknowledged packet need to be removed for providing queue capacity for other incoming packets).

Regarding claim 33, the cache of Liu for storing packets awaiting acknowledgement from gateway 116, the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to

the second gateway 116 that have not been acknowledged by the second gateway would be sent if not acknowledged within a period of time. (Claimed sending the copy of the packet from the queue via the network tunnel if the packet is dropped in the network tunnel).

Regarding claim 36, Liu discloses storing packets awaiting acknowledgement from gateway 116 , the cash including an outbound packet queue 128 that maintain copies of (or pointers to) packets transmitted by the first gateway 114 to the second gateway 116 that have not been acknowledged by the second gateway 116. See paragraphs [0019], [0023], and [0026]. (Claimed sending information to the first network device, wherein the information indicates whether the packet was dropped in the network tunnel).

Regarding claims 37 and 38, with regard to figure 2, Liu shows an inbound packet queue at the receiving gateway for storing received packets it is implicit to Liu to move packets out of the queue after processing based on earlier sequence number of the packets so to make the queue available for other incoming packets. (claimed storing the packet in a queue if the packet is received out of sequence by a second network device as in claim 37 and removing the packet from the egress queue in response to receiving at least one packet via the network tunnel, wherein the at least one packet is earlier in a sequence of packets than the packet; and forwarding the packet in response to the removing the packet from the queue, as in claim 38).

Regarding claims 48, 52, claims 48, 52 are means claims and have substantially

the same scope of respective method claims 29 and 33, thus they are subject to similar rejections.

Regarding claims 60, 64, claims 60, and 64 are computer readable medium claims comprising program instructions executable to implement the method of respective method claims 29, and 33. Liu discloses implementing the method as indicated above with regard to claims 29, and 33, using executable instructions embedded in a computer readable medium, see paragraph [0078] and claim 8.

5. Claims 14-19, 21, 39-40, 42, 44-46, and 55-58 rejected under 35 U.S.C. 102(b) as being anticipated by Chuah, US 6,487,689. Hereinafter referred to as Chuah.

Regarding claims 14, and 15, with reference to figures 2 and 7, Chuah discloses a LNS (L2TP network server) (claimed network device) comprising:

an input port to receive a packet conveyed via a network tunnel, see figure 2, column 2, lines 31-46, (claimed an input port configured to receive a packet conveyed via a network tunnel);

a processor, (figure 7, unit 650) in combination with memory (figure 7, unit 660) (claimed deferred forwarding queue) coupled to input port 666 for implementing the method, see column 6, lines 34-44; the method comprises a receiver that maintain a number of variable such as the next sequence number expected to be received see column 1, lines 54-67. Chuah also discloses a value of an adjustment variable (at the receiving peer) that represents the number of packets that may be dropped or out-of-order at the receiver before the receiver initiates recovery. See column 2, lines 1-6.

(Claimed the network device further comprising: a queue, wherein the control unit is configured to store the packet in the queue if the packet is received out of order).

Chuah discloses L2TP (Layer 2 Tunneling Protocol) in which each peer maintains number of sequence number states, and sender and receiver negotiate a transmit window size (in packets) that represents the number of packets the sender may transmit before requiring an acknowledgement from the receiver for an earlier transmitted packet, see column 2, lines 29-46. (L2TP window negotiation provides for the capacity of receiver buffer capacity as part of established TCP standard). (Claimed information indicates a capacity of deferred forwarding queue). (Claimed control unit is configured to detect reception of the packet by the input port, and generate information, and the information indicates whether the packet is a particular packet as in claim 14 and the particular packet is an expected packet as in claim 15).

Regarding claim 16, Chuah discloses that upon receipt of an in-order non-zero-length message, the receiving peer must acknowledge the message by sending back the updated value of Sr in the Nr field of the next outgoing message. The updated Sr value can be piggybacked in the Nr field of any non-zero-length outgoing messages that the peer may happen to send back, see column 3, lines 4-9. (Claimed the control unit is configured to include the information in a tunnel update packet, and the tunnel update packet includes a sequence number of a next packet expected to be received by the network device).

Regarding claim 17, Chuah discloses that upon receipt of an in-order non-zero-length message, the receiving peer must acknowledge the message by sending back

the updated value of Sr in the Nr field of the next outgoing message. The updated Sr value can be piggybacked in the Nr field of any non-zero-length outgoing messages that the peer may happen to send back, see column 3, lines 4-9. (Claimed the network device further comprises an output port, wherein the control unit is configured to forward the tunnel update packet to the output port for transmission to another network device that handles packets being conveyed in the network tunnel).

Regarding claim 19, it is implicit to Chuah to move packets out of the queue after processing based on earlier sequence number of the packet so to make the queue available for other incoming packets.

Regarding claim 21, Chuah discloses a value of an adjustment variable (at the receiving peer) that represents the number of packets that may be dropped or out-of-order at the receiver before the receiver initiates recovery. See column 2, lines 1-6. (Claimed the control unit is configured to generate the information in response to the input port receiving a plurality of packets via the network tunnel).

Regarding claim 39, with reference to figures 2 and 7, Chuah discloses a method comprising:

Receiving a packet by an LNS (L2TP network server) conveyed via a network tunnel, see figure 2, column 2, lines 31-46, (claimed receiving a packet being conveyed via a network tunnel); Chuah further discloses that upon receipt of an in-order non-zero-length message, the receiving peer must acknowledge the message by sending back the updated value of Sr in the Nr field of the next outgoing message. The updated Sr value can be piggybacked in the Nr field of any non-zero-length outgoing messages that

the peer may happen to send back, see column 3, lines 4-9. (Claimed sending information to a network device, the information indicates successful receipt of the packet). Chuah also discloses that upon receipt of an in-order non-zero-length message, the receiving peer must acknowledge the message by sending back the updated value of Sr in the Nr field of the next outgoing message. The updated Sr value can be piggybacked in the Nr field of any non-zero-length outgoing messages that the peer may happen to send back, see column 3, lines 4-9 (claimed storing the packet in a queue if the packet is received out of sequence). Chuah further discloses L2TP (Layer 2 Tunneling Protocol) in which each peer maintains number of sequence number states, and sender and receiver negotiate a transmit window size (in packets) that represents the number of packets the sender may transmit before requiring an acknowledgement from the receiver for an earlier transmitted packet, see column 2, lines 29-46. (L2TP window negotiation provides for the capacity of receiver buffer capacity as part of established TCP standard). (Claimed information indicates a capacity of deferred forwarding queue).

Regarding claims 40, 42, 44-46, Chuah discloses that upon receipt of an in-order non-zero-length message, the receiving peer must acknowledge the message by sending back the updated value of Sr in the Nr field of the next outgoing message. The updated Sr value can be piggybacked in the Nr field of any non-zero-length outgoing messages that the peer may happen to send back, see column 3, lines 4-9. (Claimed the information is sent in response to receiving a plurality of packets via the network tunnel, as in claim 40; removing the packet from the queue in response to receiving at

least one packet via the network tunnel, wherein the at least one packet is earlier in a sequence of packets than the packet; and forwarding the packet in response to removing the packet from the queue, as in claim 42; sending the packet via the network tunnel; and determining whether the packet is dropped in the network tunnel based on the information, as in claim 44; storing a copy of the packet in a queue in response to sending the packet via the network tunnel, as in claim 45; sending the copy of the packet from the queue via the network tunnel if the packet is dropped in the network tunnel, as in claim 46).

Regarding claims 55-56, and 58, claims 55-56, and 58 are means claims having substantially the same scope of rejected claims 39-40, and 42 above, thus they are subject to the similar rejections.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 67-68, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chuah.

Regarding claims 67-68, 70, claims 67-68, 70 are computer readable medium claims comprising program instructions executable to implement the method of

respective method claims 29, 32-33. Chuah does not specify computer readable medium having program instructions executable to implement the method.

However, using computer readable media having executable instructions to implement method steps is well known in the art.

It would have been obvious to a person of ordinary skill in the art, at the time the invention was made to implement the method of respective claims 29, 32-33 using computer readable media having executable instructions as known in the art. The advantage would be easy implementation of Chuah method in addition to eliminating hardware design time and further reducing cost of using software over the hardware in implementing the method.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of APA as applied to claim 1 above, and further in view of Le Gouriellec et al US 20030112756A1. Hereinafter referred to as Gouriellec.

Regarding claim 6 and 7, Liu in view of APA, while disclosing flow control (Liu, paragraph [0028]), it does not specify identifying a flow of a plurality of flows being aggregated for transmission via the network tunnel, the flow comprises a particular packet, and the control unit is configured to select whether the particular packet is admitted to the network tunnel based on the flow in which the particular packet is comprised, as in claim 6; and dropping the particular packet if the flow currently has a threshold number of packets stored in the queue; and the control unit is configured to

admit the particular packet for transmission via the network tunnel if the flow currently has fewer than the threshold number of packets stored in the queue, as in claim 7.

However, Gouriellec in the same field of endeavor of aggregated flow tunneling, discloses a method and system in which an inbound packet from an inbound traffic flow is identified as a first profile packet if the packet conforms to a first traffic flow profile, and identifying the packet as a second profile packet if the packet conforms to a second traffic flow profile. The packet conforms to the first traffic flow profile if the packet is transmitted within a committed bandwidth subscription for the flow, and conforms to the second traffic profile if the packet is transmitted outside the committed bandwidth subscription for the flow but within a conditional bandwidth subscription for the flow, such that during periods of network congestion, the first profile packet is stored in an area of a queue reserved for storing first profile packets and the second profile packet is discarded, see paragraph [0008]. Gouriellec further discloses dropping the packet based on the filling level of the queue, see paragraph [0039]. (Correspond to claimed limitations of claims 6 and 7).

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to enhance the method/system of Liu in view of APA with the details of flow control of Gouriellec so to optimized the transmission bandwidth and to implement the service level agreement agreed upon by the plurality of subscribers. (Gouriellec [0027], and [0032]).

8. Claim 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of APA as applied to base claim 1 above, and further in view of Bishard, US 2003/0165148.

Regarding claims 11, 12, Liu discloses examples of recovering lost packets comprising include congestion control algorithms such as a slow start algorithm, a congestion avoidance algorithm, a fast transmit algorithm, and a fast recovery algorithm and other, similar algorithms, see paragraph [0048]. Liu doesn't specify the details of the algorithms such as controlling a usage level of the queue by adjusting a rate at which packets are removed from the queue, and admitting a particular packet for transmission via the network tunnel based on the usage level of the queue, as in claim 11; and reducing the rate at which packets are removed from the queue if the usage level of the queue exceeds a threshold usage level, as in claim 12.

However, Bishard discloses controlling a usage level of the queue by adjusting a rate (including reduction rate based on the queue usage level threshold) at which packets are removed from a queue, and admitting particular packets based on the usage level of the queue. See [0013] and [0040].

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the admission control of Bishard in the method/system of Liu in view of APA so to implement one of the congestion control algorithm of Liu. The advantage would be the ability of Liu in view of APA system to avoid congestion by dynamically controlling the available bandwidth and further ease the dropping of packets resulting in increased reliability of Liu method/system.

9. Claims 26, 34, 35, 53, 54, 65 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Brewer et al, US 2006/0062233.

Regarding claim 26, Liu discloses examples of recovering lost packets comprising include congestion control algorithms such as a slow start algorithm, a congestion avoidance algorithm, a fast transmit algorithm, and a fast recovery algorithm and other, similar algorithms, see paragraph [0048]. Liu doesn't specify applying a packet drop algorithm to packets being transmitted via the network tunnel, and the packet drop algorithm differentiates between different packet flows being aggregated for transmission via the network tunnel.

However, Brewer discloses a drop algorithm applied to received packet prior to forwarding over a link 104, the drop algorithm differentiates between different packet flows being aggregated for transmission via the link, see abstract.

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the drop algorithm in the method/system of Liu as taught by Brewer. The method/system of Liu can be modified to accommodate flows having packets with associated Quality of Service (QoS) and to select a packet for transmission based on the flow in which the packet belongs. The advantage would be the ability to prioritize the dropping of particular packets in accordance with the level of the QoS. (Brewer).

Regarding claims 34, 35, 53, 54, 65 and 66, as indicated above, Liu discloses substantially all the limitations of respective parent claims 29, 48 and 60, Liu doesn't

specify the steps of or instruction/ or means for identifying a flow of a plurality of flows being aggregated for transmission via the network tunnel, wherein the flow comprises a particular packet; and selecting whether the particular packet is admitted to the network tunnel based on the flow in which the particular packet is comprised, as in claims 34, 35, 53, and 65; or admitting a particular packet for transmission via the network tunnel dependent on the usage level of the queue, wherein the controlling the usage level of the queue comprises: adjusting a rate at which packets are removed from the queue.

Brewer discloses identifying a flow of a plurality of flows being aggregated for transmission over a link, each flow comprises packets wherein priority transmission is given based on the QoS flow in which a specific packet belong, and adjusting QoS queues level utilization for transmission rate adjustments. See abstract, figure1, 2A-2D, paragraph [0007], and [0030].

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the teaching of Brewer applied to the flows of Liu, the cache of Liu can be modified to incorporate the different QoS queues of Brewer so that fair share of transmission bandwidth can be allocated to contending flows while maintaining the service level guarantees and also increase the throughput of the method/system of Liu (Brewer).

10. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chuah in view of Brewer.

Regarding claim 47, Chuah does not disclose admitting a packet to the network tunnel dependent on which one of a plurality of flows being aggregated for transmission via the network tunnel comprises the particular packet.

Brewer discloses transmitting packet over a connection based on a particular QoS flow in which the packet belongs. see column See abstract, figure1, 2A-2D, paragraph [0007], and [0030].

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the teaching of Brewer applied to the flows of Chuah, Chuah can be modified to incorporate the different QoS queues of Brewer so that fair share of transmission bandwidth can be allocated to contending flows while maintaining the service level guarantees and also increase the throughput of the method Chuah (Brewer).

11. Claims 20, 31, 43, 50, 59, 62, 63 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chuah in view of Banister, US 6,145,032.

Regarding 20, 31, 50, 59, 62, 63 and 71, Chuah does not disclose sending a packet via a port associated with the packet after removing a packet from the queue.

However Bannister discloses recirculating (claimed send(ing)) a packet via a port associated with the packet after removing a packet from a queue. See figure 3, column 5, lines 16-37.

Therefore, it would have been obvious to a person of ordinary skill in the art to reirculate packet to the port associated with the packet removed from the transmitter

queue in accordance with the teaching of Bannister in the system of Chuah so that queued packet awaiting retransmission can be retransmitted with minimum delay(Bannister).

Response to Arguments

12. Applicant's arguments with respect to claims 1, 4-17, 19-29, 31-40, 42-48, 50-56, 58-60, 62-68 and 70-71 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (571)272-3097. The examiner can normally be reached on 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AHMED ELALLAM/
Examiner, Art Unit 2616
7/16/08

/Chi H Pham/
Supervisory Patent Examiner, Art Unit 2616
7/18/08